**Paper Engineering Project (50pts)**

As we discussed with the electricity project, teachers are always looking for a way to tie classroom learning to upcoming events/holidays. Good teachers also look for hands-on activities to promote student engagement and extend learning. Paper-engineering a product such as a pop-up card or book, can also provide a natural hook for students and typically provides the student with something that can be taken home and placed prominently on a shelf or the refrigerator door allowing them to creatively demonstrate what they have learned.

**Task:**

For this project you conduct research on the best way to design a paper engineering solution and then develop a paper engineering design that could be used to integrate STEM content in your future classroom. You will develop a teaching model inside of a file folder. This type of an assignment is another way that students can demonstrate their understanding of content and can be more engaging than just completing another worksheet.

* Select a big idea (ocean layers, plant/animal life-cycles, etc).
* Conduct research on the topic, identify standards, etc.
* Plan and design your solution.
* Start creating.

Your 3-dimensional pop-up solution must include at least three pop-ups or mechanisms and additional paper sculpting techniques to bring the design to life. **Please note that tabs that lift to display text do not count as a pop-up, although you may include these.**

On the back of your folder include the grade level, standard (science, technology and engineering, or mathematics), and an appropriate additional standard that could be integrated into this type of project.

A poster with different colored paper objects

Description automatically generated with medium confidenceA step by step instructions to make a box pop up

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**Paper Engineering Project Rubric (50 pts)**

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| **Criteria** | **Exemplary (10 pts)** | **Proficient (8 pts)** | **Developing (6 pts)** | **Needs Improvement (4 pts)** | **Points Earned** |
| **Design Creativity & Innovation** | Design is highly creative, innovative, and clearly demonstrates advanced paper engineering techniques. | Design is creative and demonstrates effort, with effective paper engineering techniques. | Design is somewhat creative, but techniques are basic or lack refinement. | Design lacks creativity and effort, with minimal or ineffective techniques. |  |
| **Mechanisms (Pop-ups & Sculpting)** | Includes at least three well-constructed, functional pop-ups or mechanisms and uses paper sculpting techniques effectively. | Includes at least three functional pop-ups or mechanisms, though execution could be improved. | Includes minimal pop-ups or mechanisms, or with significant flaws. | Pop-ups or mechanisms are absent or non-functional. |  |
| **Integration of STEM Content** | Clearly integrates STEM content aligned with grade level and standards, with thoughtful connection to the project. | Integrates STEM content aligned with grade level and standards, though connections may lack depth. | Integration of STEM content is limited or weakly connected to grade level and standards. | Little to no integration of STEM content is evident. |  |
| **Presentation & Aesthetics** | Model is well-crafted, visually appealing, and polished, showing attention to detail. | Model is visually appealing with some attention to detail but may have minor inconsistencies. | Model is functional but lacks attention to visual appeal or neatness. | Model is incomplete, messy, or lacks coherence. |  |
| **Grade Level & Standards Alignment** | Grade level, STEM standard, and additional standard are clearly articulated, appropriate, and effectively integrated. | Grade level, STEM standard, and additional standard are articulated but may lack clarity or complete alignment. | Grade level, STEM standard, or additional standard are unclear or inappropriate. | Grade level, STEM standard, and additional standard are missing or irrelevant. |  |
| **Comments:**  **Total Points:** \_\_\_ / 50 | | | | | |

**Big Idea**

**Standards**

**1.**

**2.**

**Content Information**

**Plan and design your solution**

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